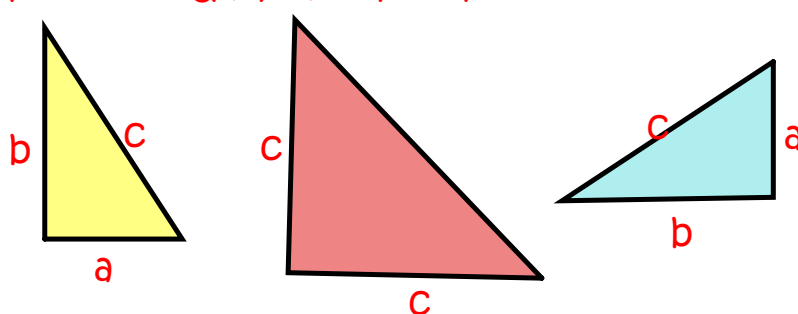


#6 - President Garfield's Proof

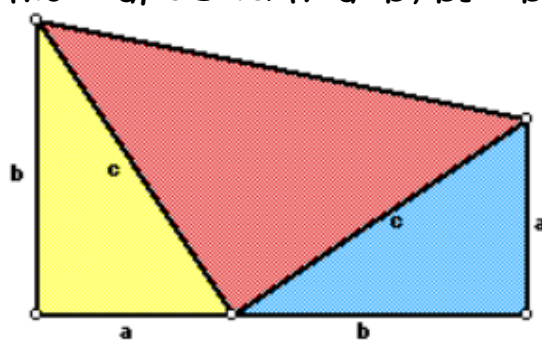


1. President Garfield was able to prove the Pythagorean Theorem by rearranging the triangles shown to make a trapezoid. Rearrange them to make a trapezoid.
2. Find the area of the trapezoid you created.
3. Find the sum of the areas of the three triangles.
4. Since the area of the trapezoid is the same as the sum of the areas of the triangles, Create an equation showing this and show how President Garfield proved the Pythagorean Theorem.

Hint #1

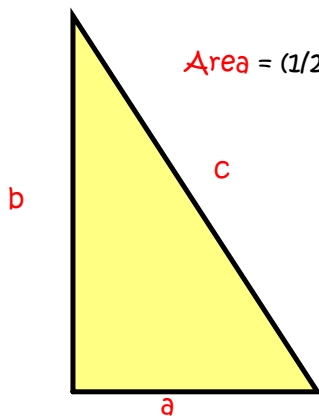
Area of a Trapezoid: $(1/2) h (b_1 + b_2)$

In this trapezoid $h = a + b$, $b_1 = b$ and $b_2 = a$



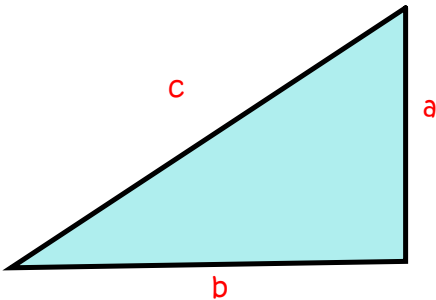
Hint #2

$$\text{Area} = (1/2) (b) (a)$$



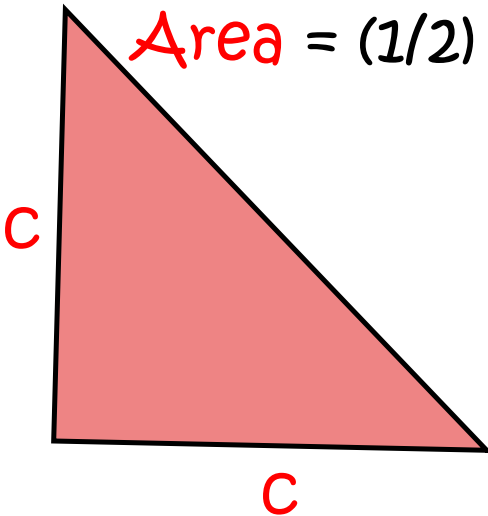
Hint #3

Area = (1/2) (a) (b)

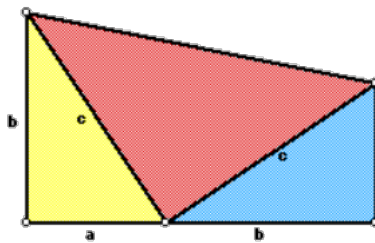


Hint #4

Area = (1/2) (C) (C)



Answer



$$\begin{aligned}
 \text{Area}_{\text{trapezoid}} &= \text{Sum Areas of the triangles} \\
 (1/2)(a+b)(b+a) &= (1/2)(ba) + (1/2)(c^2) + (1/2)(ab) \\
 (1/2)(a^2 + 2ab + b^2) &= (1/2)(2ab + c^2) \\
 (a^2 + 2ab + b^2) &= (2ab + c^2) \\
 a^2 + b^2 &= c^2
 \end{aligned}$$